

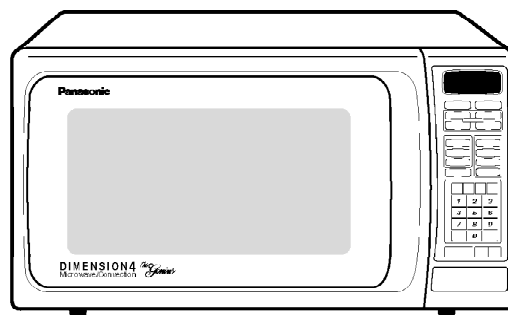
ORDER NO. MOD9809206C1

E1

Service Manual

Microwave Oven

NN-C988B / NN-C988W



SPECIFICATIONS

Specifications

		APH / CPH
Power Source:		120 V AC, 60 Hz
Power Requirement:	Microwave	1,500 W
	Heater	1,500 W
Output:	Microwave	850 W: Full Power (IEC 705-88)
	Heater	1,400 W
Microwave Frequency:		2,450 MHz
Timer:		30 MIN (HIGH) / 99 min. 99 sec. / 9 hr. 99 min.
Outside Dimensions:		14-13/16 " (H) X 23-7/8 "(W) X 19-5/16 " (D) 376 mm (H) X 606 mm (W) X 491 mm (D)
Oven Cavity Dimensions:		9-1/2 " (H) X 16-1/4 "(W) X 16-13/16 " (D) 242 mm (H) X 412 mm (W) X 426 mm (D)
Weight:		Approx. 54 lbs / 24.5 kg
Specifications subject to change without notice.		

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

WARNING

1. This product should be serviced only by trained qualified personnel.
2. Though this product has been manufactured in compliance with:
"Federal Performance Standard 21 CFR Subchapter J" (D.H.H.S.); U.S.A. models
or "Radiation Emitting Devices Act" (Health and Welfare Canada); Canadian models
It is very important all repairs should be made in accordance with procedures described in this manual to avoid being exposed to excessive microwave radiation.
3. Check for radiation leakage before and after every servicing according to the "procedure for measuring radiation leakage".
4. If the unit cannot be repaired on site, advise the customer not to use until unit be repaired.
5. Any serviceman who learns of any accident pertaining to microwave radiation leakage including the oven operating with open door should immediately notify the appropriate address listed below and Center for Devices and Radiological Health, DHHS.

IN U.S.A.
(PASC) Panasonic Services Company
50 Meadowland Parkway,
Secaucus, New Jersey 07094
Attention: Technical Service Division.
(201) 348-7000

IN PUERTO RICO
(PSC)

PSC
San Gabriel Industrial Park
65th Infantry Ave. Km. 9.5.
Carolina, Puerto Rico 00985
(809) 750-4300
Panasonic Canada Inc.
5770 Ambler Drive, Mississauga,
Ontario, L4W2T3
(905) 624-5010

IN CANADA
(PCI)

6. There are special components used in the microwave oven which are important for safety. These parts are marked with a **⚠** on the replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent microwave leakage, shock, fire, or other hazards. Do not modify the original design.

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

- | | |
|--|---|
| <p>(A) Do not operate or allow the oven to be operated with the door open.</p> <p>(B) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary:</p> <ol style="list-style-type: none">(1) Interlock operation(2) Proper door closing(3) Seal and sealing surfaces (arcing, wear, and other damage)(4) Damage to or loosening of hinges and latches(5) Evidence of dropping or abuse | <p>(C) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, waveguide or transmission line, and cavity for proper alignment, integrity and connections.</p> <p>(D) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.</p> <p>(E) A microwave leakage check to verify compliance with the Federal Performance Standard should be performed on each oven prior to release to the owner.</p> |
|--|---|

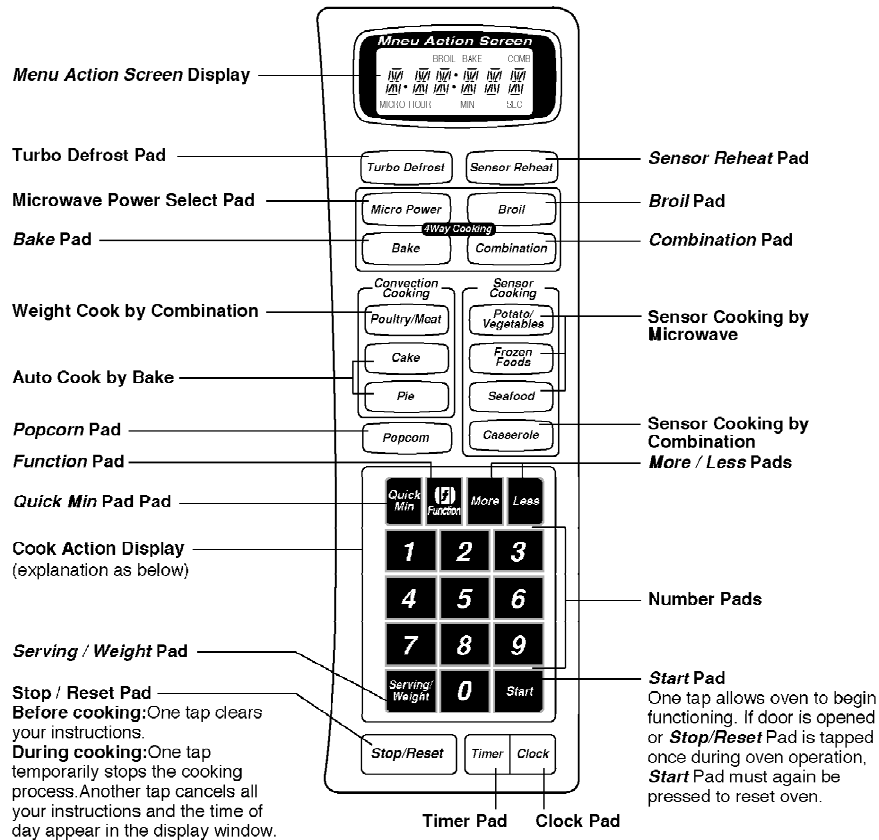
Panasonic®

1. FEATURE CHART

FEATURE	NN-C988B, NN-C988W
Three Stage Cooking	×
Auto Reheat	×
Auto Cooking	×
Turbo Defrost	×
Bake	×
Broil	×
Combination	×
Popcorn	×
Quick Minute	×
Child Safety Lock	×
Menu Action Screen Display	×
Timer/Stand Time	×
Digital Clock	×

2. CONTROL PANEL

Control Panel



Cook Action Display:

This totally unique feature of your PANASONIC guides you through the entire cooking process with its illuminated INTERACTIVE CONTROL PANEL. Once a pad has been selected, the COOK ACTION DISPLAY will prompt you to the NEXT step until cooking starts.

e.g.



• Press Serving/Weight Pad will illuminate and begin to flash, letting you know that you must enter a serving weight.

• Press Start Pad.

Prompters:

When a pad is pressed, a beep sound is heard and the corresponding letter or word(s) appear and scroll across the screen. If a pad is pressed and no beep is heard, the unit does not or cannot accept the instruction. As each pad is pressed the corresponding word(s) scroll across the screen. Words will automatically appear to prompt user to perform the next step. It is not necessary to wait for the words to appear before pressing pads for the next step. A two beep sound is heard between stages. At the end of any complete program, the oven will beep five times.

Functions

The unique function feature of your PANASONIC microwave oven allows you to set the non-cooking features of your oven, such as CHILD LOCK, WORD SPEED, LANGUAGE CHOICE (ENGLISH, SPANISH OR FRENCH), plus many more. See below



1

LANGUAGE CHOICE

The oven has English, French and Spanish displays. The default setting is English.

- 1. ENGLISH → Display appears in English.
- 2. FRANCAIS → Display appears in French.
- 3. ESPANOL → Display appears in Spanish.

2

Lb/ kg CHOICE

The oven has both imperial and metric weight measurements. The default setting displays the weight in imperial measurements.

- 1. Lb → Weight can be set in lb/oz.
- 2. kb → Weight can be set in g/kg.

3

WORD SPEED

The word scrolling speed can be accelerated or slowed down.

- 1. QUICK → Words scroll quickly.
- 2. MEDIUM → Scrolling speed reverts to initial setting.
- 3. SLOW → Words scroll slowly.

4

MENU ACTION ON/OFF

MENU ACTION SCREEN helps you program your oven by prompting you with the next step. When you become familiar with your oven, the Prompting Guide can be turned off.

- 1. ON → Prompting Guide will appear.
- 2. OFF → Prompting Guide will not appear.

5

CHILD LOCK ON/OFF

The Child Safety Lock feature prevents children from using the oven.

- 1. ON → Child Lock has been set and operation is impossible.
- 2. OFF → Child Lock has been cancelled.

6

BEEP ON/OFF

If you wish to have the oven operate without beeping, this feature can be turned off.

- 1. ON → Beep sound will be heard.
- 2. OFF → Beep sound will not be heard.

7

REMINDER BEEP ON/OFF

A reminder beep reminds you to remove the food from the oven after cooking is complete. The oven beeps every few seconds.

- 1. ON → Reminder beep activated.
- 2. OFF → Reminder beep deactivated.

8

DAYLIGHT SAVING ON/OFF

- 1. ON → Time of day will advance one hour.
- 2. OFF → Time of day remains the same.

9

CLOCK ON/OFF

Clock display can be turned off.

- 1. ON → Clock display will appear in the display window.
 - 2. OFF → Clock display will not appear in the display window.
- Time of day will remain in memory even when the display is off.

0

DEMO MODE ON/OFF

Demo mode is designed for retail store display. In this mode, the oven can be demonstrated without turning the oven on.

- 1. ON → Demo mode is activated.
- 2. OFF → Demo mode is deactivated.

3. OPERATION AND DEIGITAL PROGRAMMER CIRCUIT TEST PROCEDURE

1. To Set Clock

OPERATION	SCROLL DISPLAY
1. Plug the power supply cord into wall outlet.	WELCOME TO PANASONIC REFER TO OPERATING INSTRUCTIONS BEFORE USE
2. Press Clock pad twice.	 --SET TIME
3. Enter time of day (TOD) by pressing appropriate Number pads.	1 1 : 2 5 --PRESS CLOCK
4. Press Clock pad. TOD has now been registered into the digital programmer circuit and will count up by minutes.	1 1 : 2 5

2. Time Cooking for Two Stage

OPERATION	SCROLL DISPLAY
1. Place a water load in the oven.	
2. Press Micro Power pad once to set High power. (1st stage)	HIGH --SET TIME
3. Set for 5 seconds by pressing 5 pad.	5 SEC --PRESS START HIGH
4. Press Micro Power pad 4 times to set Medium power. (2nd stage)	MEDIUM --SET TIME
5. Set for 1 minute by pressing 1, 0, 0 pads.	1 0 0 MIN SEC --PRESS START MEDIUM
6. Press Start pad.	 5 MICRO SEC
7. When 1st stage cooking time has elapsed, oven automatically switches to 2nd stage cooking.	 1 0 0 MIN SEC
8. When 2nd stage cooking time has elapsed, oven beeps 5 times and shuts off.	ENJOY YOUR MEAL Time of day or colon appears in the display.

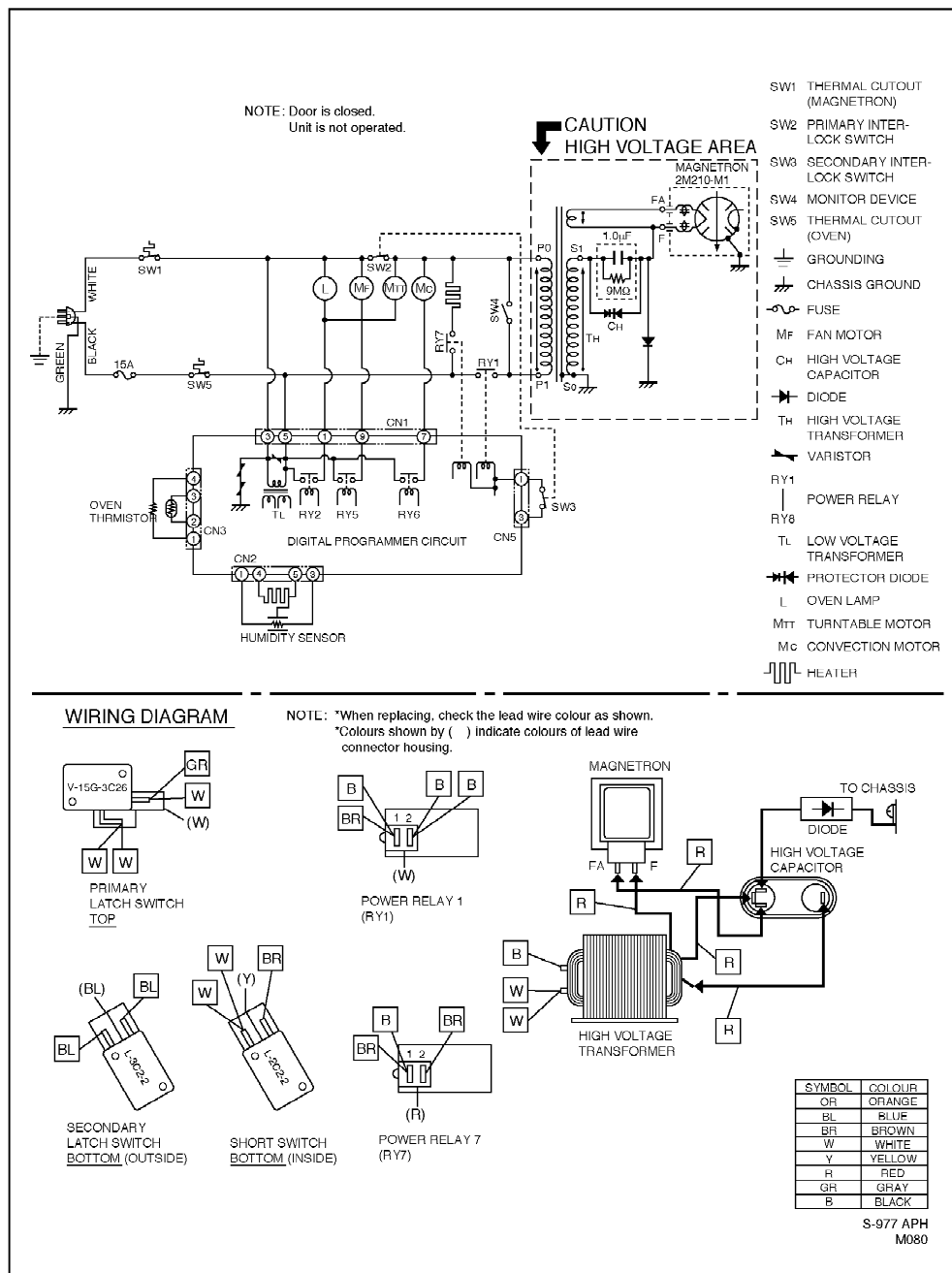
3. Auto Weight Defrost

OPERATION	SCROLL DISPLAY
1. Press Turbo Defrost pad.	AUTO DEFROST --SET WEIGHT
2. Set the weight for 3 pounds by pressing 3, 0 pad.	3.0Lb --PRESS START
3. Press Start pad.	 2 0 1 8 MICRO MIN SEC

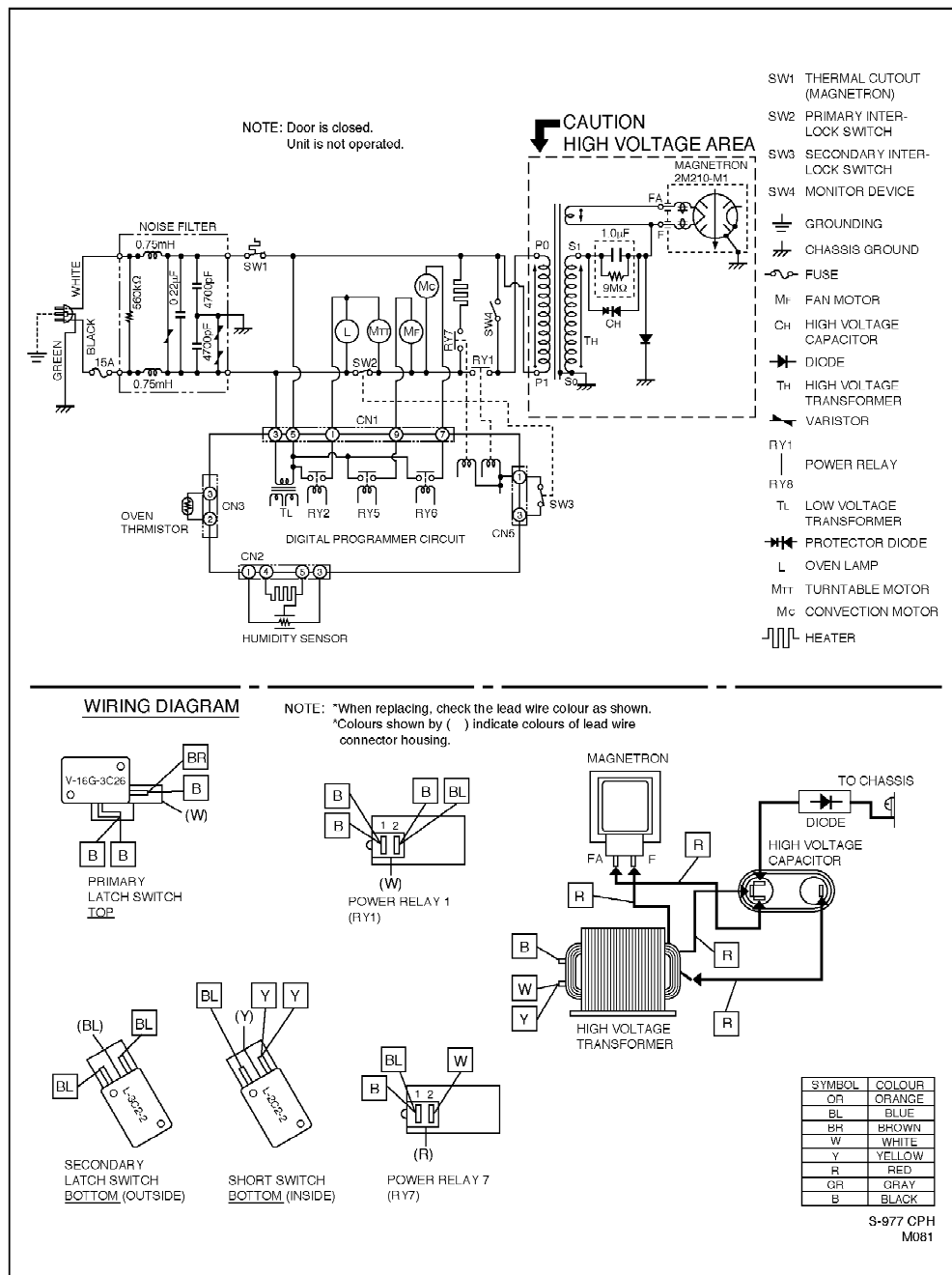
4. Bake Cooking with Preheat

OPERATION	SCROLL DISPLAY
1. Press Bake pad twice.	BAKE 225F --PRESS START
2. Press Start pad.	 BAKE P
3. When preheating is completed, oven beeps 3 times.	 P BAKE END
4. After completion of preheating, be sure to open the door.	225F --SET TIME
5. Close the door and set convection cooking time for 2 minutes.	H 2 --PRESS START 225F
6. Press Start pad.	 2 0 0 MIN SEC BAKE

4. SCHEMATIC DIAGRAM (FOR USA)



5. SCHEMATIC DIAGRAM (FOR CANADA)



6. DESCRIPTION OF OPERATING SEQUENCE

6.1. Variable power cooking control

The coil of power relay 1 (RY1) is energized intermittently by the digital programmer circuit, when the oven is set at any power selection except for High power position. The digital programmer circuit controls the ON-OFF time of power relay 1 contacts in order to vary the output power of the microwave oven from "LOW" to "HIGH" power. One complete ON and OFF cycle of power relay 1 is 22 seconds. The relation between indications on the control panel and the output of the microwave oven is as shown in table.

NOTE: The ON/OFF time ratio does not correspond with the percentage of microwave power

since approximately 2 seconds are required for heating of magnetron filament.

6.2. Auto weight defrost

When auto weight defrost is selected and the Start Pad is tapped:

- 1. The digital programmer circuit determines the power level and cooking time to complete cooking and indicates the operating state in the display window. Table shows the corresponding cooking times for respective serving by categories.**
- 2. When cooking time in the display window has elapsed, the oven turns off automatically by a control signal from the digital programmer circuit.**

6.3. Bake/Broil cooking control

The digital programmer circuit controls the ON-OFF time of the heater in order to control oven cavity temperature.

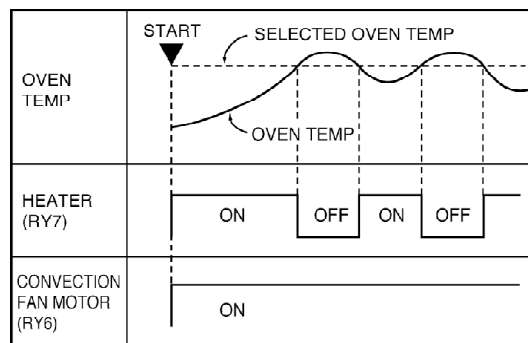
- 1. After the start pad is tapped with the desired Bake/Broil program set, an 18V DC signal comes out of the digital programmer circuit and is applied to coil of power relay 7 (RY7).**
- 2. When the contacts of power relay 7 close, power source voltage (120V AC) is applied to the heater and the heater turns on.**
- 3. When the oven temperature reaches the set temperature, the digital programmer circuit senses the temperature through oven temp sensor and stops supplying an 18V DC signal to the coil of power relay 7 and the heater turns off.**
- 4. After the heater turns off, the oven temperature will continue increasing a while and then decrease as shown in Figure. When the oven temperature drops below the set temperature, the digital programmer circuit senses the signal and starts supplying an 18V DC signal to the coil of power relay again.**

NOTE: When Broil feature is selected, oven temperature is determined automatically as shown in Figure.

POWER SETTING	ON-OFF TIME OF POWER RELAY 1 (RY1)	
	ON (SEC)	OFF (SEC)
HIGH (850W)	22	0
MEDIUM-HIGH (600W)	17	5
MEDIUM (440W)	13	9
MEDIUM-LOW (250W)	8	14
LOW (135W)	5	17
DEFROST (250W)	8	14

Auto Weight Defrost

WEIGHT SELECTED	TOTAL DEFROSTING TIME
1 lb	6 min. 05 sec.
3 lb	20 min. 18 sec.



96-017M

Broil Cooking

CATEGORY	OVEN TEMP
Broil	450°F

6.4. Combination cooking control

Combination cooking is accomplished by microwave and convection cooking being done alternately during one combination cooking cycle. One combination cooking cycle is 22 seconds.

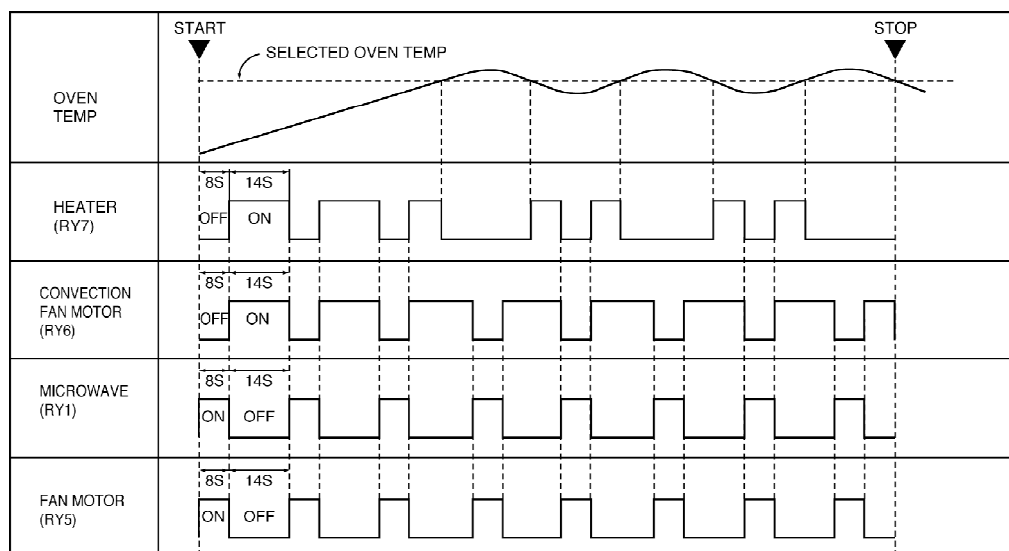
1. During combination cooking, the digital programmer circuit controls ON-OFF time of both power relay 1 and 7 as shown in Figure.
2. When the power relay 1 (RY1) is turned on, heater turns off and after the power relay 1 turns off, power relay 7 turns on.

NOTE 1: Note that the heater may not be on during a heater on period if the preprogrammed oven temperature has been reached. This is due to the fact that the oven is keeping the preprogrammed oven temperature constant, so of course the heater will only be on when it is needed and off when it is not needed.

NOTE 2: As for temperatures of combination cooking for convection, the temperatures by each program are preprogrammed in the microprocessor as shown in Figure.

Combination Cooking

CATEGORY	MICROWAVE	HEATER	OVEN TEMP
1	8/22 SEC	14/22 SEC	275°F
2	8/22 SEC	14/22 SEC	300°F
3	8/22 SEC	14/22 SEC	325°F
4	8/22 SEC	14/22 SEC	375°F



96-018M

6.5. Auto cooking control

When the Auto Control, Cooking feature is selected by tapping the appropriate key pads and Start pad is tapped.

1. The digital programmer circuit determines the power level, oven temperature and combination, bake cooking time to complete cooking and indicates the operating state in the display window. Table shows the combination cooking times for respective weights.
2. When the cooking time in the display window has elapsed, the oven turns off automatically by the controlled signal from the digital programmer circuit.

MENU	SERVING/WEIGHT	COOKING TIME
BEEF MEDIUM	1.0 lb	16 min. 51 sec.
POPCORN	3.5 oz/99 g	3 min. 05 sec.

6.6. One touch Auto sensor cooking

MENU
Sensor Reheat, Potato, Vegetables, Frozen Vegetables, Frozen Entree, Frozen Dinner, Fish, Shellfish, Casserole

Auto sensor cooking is a revolutionary way to cook by microwave without setting a power level or selecting a time. All that is necessary is to select an Auto sensor Program before starting to cook.

Understanding of Cooking

As food cooks, a certain amount of steam is produced. If the food is covered, this steam builds up and eventually escapes from the container. In Auto Sensor Cooking, carefully designed instrument, called the humidity sensor element, senses this escape of steam. Then, based upon the Auto Sensor Program selected, the unit will automatically determine the correct power level and the proper length of time it will take to cook the food.

NOTE: Auto Sensor Cooking is successful with the foods and recipes found in the Auto Sensor Cooking Guide. Because of the vast differences in food composition, items not mentioned in the Cooking Guide should be prepared in the microwave oven using power select and time features. Please consult Variable Power Microwave Cookbook for procedures.

Explanation of the Auto Sensor Cooking process

- 1) The shaded columns in Figure indicate when the humidity sensor heater is on.
- 2) During the 30 second period there is no microwave activity. When calculating the T2 time by using the formula below, make sure this 30 seconds is subtracted from the T0 time.
- 3) T1 time To time - 30 seconds
- 4) T2 time When the steam escapes from the cooking container placed in the oven, the humidity sensor detects it and the microprocessor calculates the balance of cooking time. This T2 time is then shown in the display and begins counting down.

Balance of cooking time (T2 time)

The balance of cooking time which is called T2 time, can be calculated by the following formula.

$$T2 \text{ time (in sec.)} = T1 \text{ time} \times K \text{ factor}$$

NOTE: Remember, the T1 time starts after the Start pad is tapped. The coefficient K is programmed into the microprocessor memory and they are listed in the following tables along with the P1 and P2 powers.

NOTE: When "More" or "Less" pad is selected, the K factor varies resulting in T2 time to be increased or decreased.

NOTE: For T2 time of Category Casserole, HEATER operation programmed.

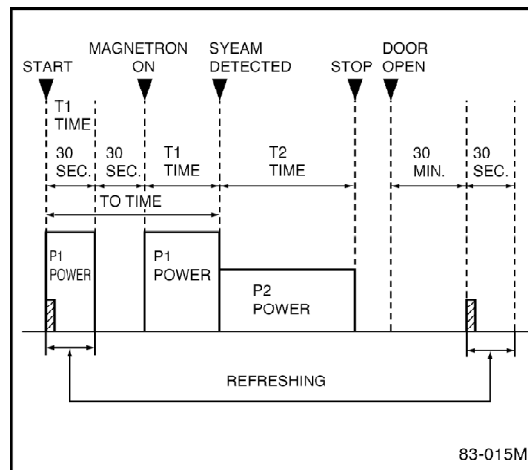
Example of calculating the T2 time

Example 1: If the T1 time is measured to be 2 minutes and 40 seconds, and the Auto Sensor program selected is Sensor Reheat.

$$T2 = T1 \times K$$

$$= 2 \text{ min. and } 40 \text{ sec.} \times 0.3$$

$$= 48 \text{ sec.}$$



Auto Sensor Cook

Category	P1 Power	P2 Power	K factor Standard
Sensor Reheat	HIGH	HIGH	0.3
Frozen Entree	M. HIGH	M. HIGH	0.6
Casserole	HIGH	M. LOW MICROWAVE: 8S HEATER: 14S	4.0

7. CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING

Unlike many other appliances, the microwave oven is high-voltage, high-current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

CAUTION

Servicemen should remove their watches whenever working close to or replacing the magnetron.

7.1. Check the grounding

Do not operate on a 2-wire extension cord. The microwave oven is designed to be used when grounded. It is imperative, therefore, to make sure it is grounded properly before beginning repair work.

7.2. Warning about the electric charge in the high voltage capacitor

For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitor.

When replacing or checking parts, remove the power plug from the outlet and short the terminal of the high voltage capacitor (terminal of lead wire from diode) to chassis ground with an insulated handle screwdriver or discharge.

WARNING

There is high-voltage present, with high-current capabilities in the circuits of the high voltage winding and filament winding of the high voltage transformer. It is extremely dangerous to work on or near these circuits with oven energized. DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

WARNING

Never touch any circuit wiring with your hand nor with an insulated tool during operation.

7.3. When parts must be replaced, remove the power plug from the outlet.

7.4. When the 15 Amp fuse is blown due to the operation of short switch:

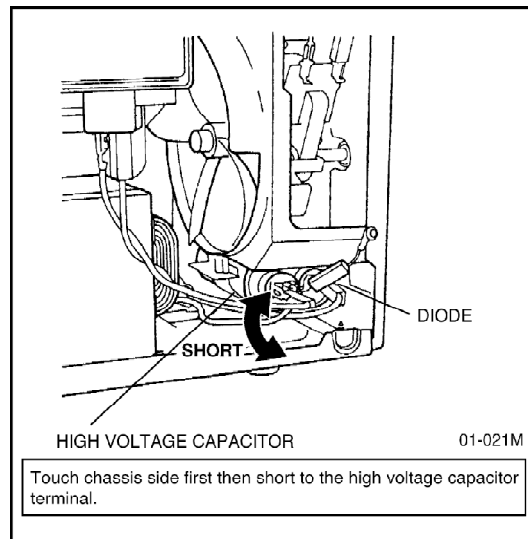
WARNING

When the 15 Amp. fuse is blown due to the operation of short switch, you must replace Primary latch switch and short switch. Also replace power relay 1 (RY1) when the continuity check reads shorted contacts (1-2).

- 1. This is mandatory. Refer to "Adjustments and Measurement" for these switches.**
- 2. When replacing the fuse, confirm that it has the appropriate rating for these models.**
- 3. When replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.**

7.5. Avoid inserting nails, wire, etc. through any holes in the unit during operation.

Never insert a wire, nail or any other metal object through the lamp holes on the cavity or any other holes or gaps, because such objects may work as an antenna and cause microwave leakage.



7.6. Confirm after repair

1. After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor missing. Microwaves might leak if screws are not properly tightened.
2. Make sure that all electrical connections are tight before inserting the plug into the wall outlet.
3. Check for microwave energy leakage. (Refer to procedure for measuring microwave energy leakage.)

8. DISASSEMBLY AND PARTS REPLACEMENT PROCEDURE

8.1. Magnetron

1. Discharge the high voltage capacitor.
2. Remove 2 screws holding magnetron thermal cutout bracket.
3. Disconnect 2 high voltage lead wires from magnetron filament terminals.
4. Remove 4 screws holding the magnetron.

NOTE: After replacement of the magnetron, tighten mounting screws properly making sure there is no gap between the waveguide and the magnetron to prevent microwave leakage.

CAUTION
When replacing the magnetron, be sure the antenna gasket is in place.

8.2. Digital programmer circuit (DPC) and membrane key board.

NOTE: Be sure to ground any static electric charge built up on your body, before handling the DPC.

- 1. Disconnect all connectors from D.P.C.**
- 2. Remove 3 screws holding escutcheon base and slide the escutcheon base upward slightly.**
- 3. Release CN4 connector's lock of DPC by pushing both levers to inside and pull them upward, and remove flat cable of membrane key board.**
- 4. Remove 3 screws holding DPC.**

To replace membrane key board

- 5. Remove escutcheon bracket from escutcheon base by freeing 4 catch hooks on the escutcheon base.**
- 6. Peel off the tub of membrane key board from escutcheon base.**
- 7. Push the upper part of key board (display window portion) from back of escutcheon base and peel off escutcheon sheet and membrane key board completely from escutcheon base.**

NOTE: 1. The membrane key board is attached to the escutcheon base with double faced adhesive tape. Therefore, applying hot air such as using of hair dryer is recommended for smoother removal.

NOTE: 2. When installing new membrane key board, make sure that the surface of escutcheon base is cleaned sufficiently so that any problems (shorted contacts or uneven surface) can be avoided.

NOTE: 3. Alignment position of membrane key board and escutcheon sheet are as follows (See figure);

Membrane key board: Right and upper edges

Escutcheon sheet: Right and lower edges

8.3. Low voltage transformer and/or power relays

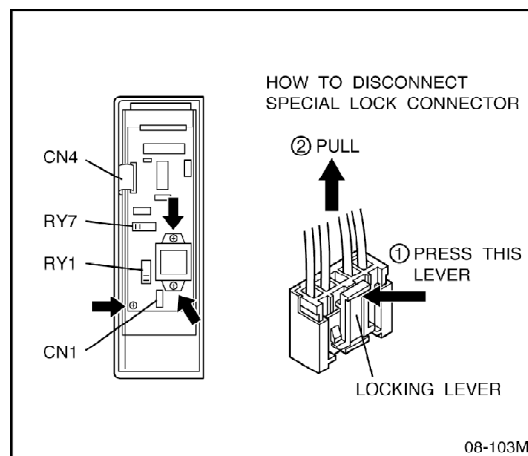
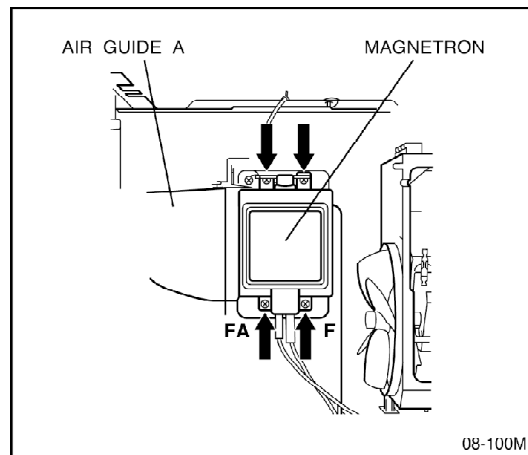
NOTE: Be sure to ground any static electric charge built up on your body before handling the

DPC.

1. Using solder wick or a desoldering tool and 30W soldering iron, carefully remove all solder from the terminal pins of the low voltage transformer and/or power relays.

NOTE: Do not use a soldering iron or desoldering tool of more than 30 watts on DPC contacts.

2. With all the terminal pins cleaned and separated from DPC contacts, remove the defective transformer/power relays and install new transformer/power relays making sure all terminal pins are inserted completely. Resolder all terminal contacts carefully.



8.4. Fan motor and high voltage capacitor

1. Disconnect 2 lead wires from fan motor terminals.
2. Disconnect 2 lead wires from fuse holder terminals.
3. Disconnect 4 high voltage lead wires from high voltage capacitor

terminals.

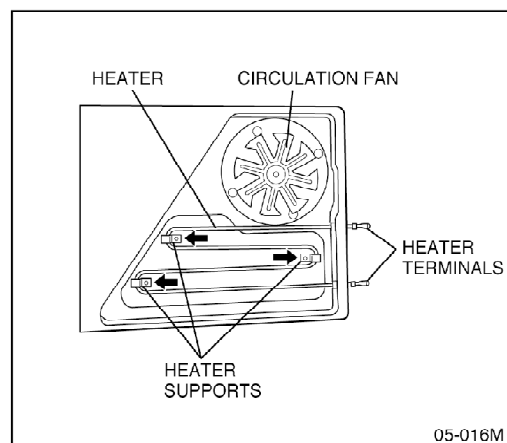
4. Remove 4 screws holding fan motor and orifice assy and detach the orifice assy with fan motor from oven assy.
5. Remove fan blade from the fan motor shaft by pulling it straight out.
6. Separate the fan motor from the orifice assy by freeing 2 catch hooks on the orifice assy.

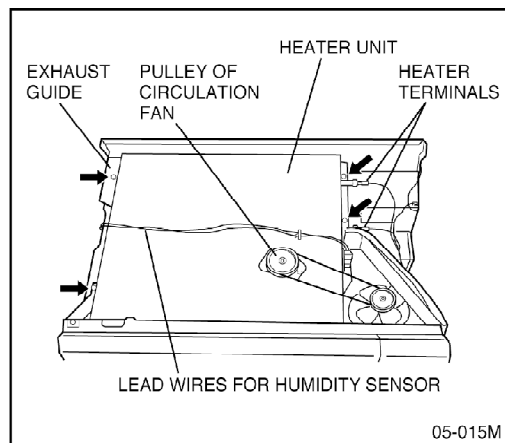
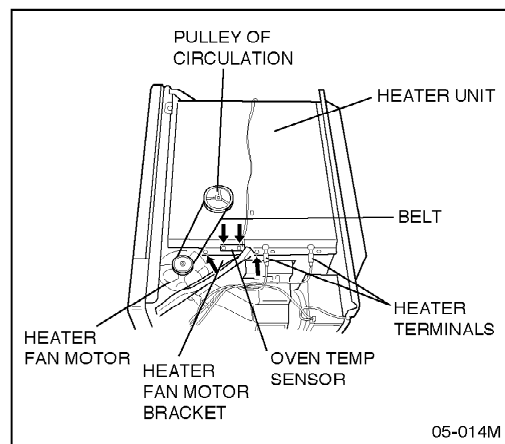
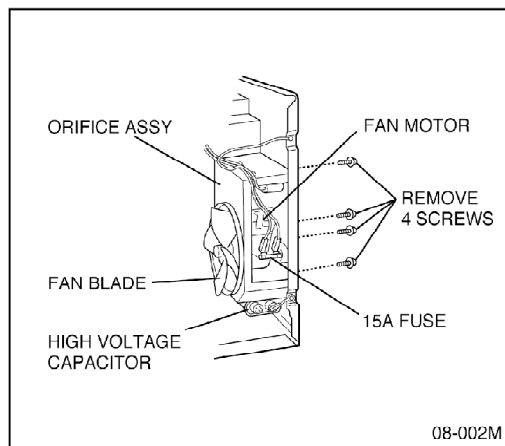
To replace high voltage capacitor

7. Remove 1 screw holding high voltage capacitor.

8.5. Heater

1. Remove lead wires from lead wire holders.
2. Remove belt from pulleys of circulation fan.
3. Remove 2 screws holding heater fan motor bracket.
4. Remove 1 screw holding exhaust guide.
5. Remove 2 screws holding oven temp sensor.
6. Disconnect 2 lead wires from heater terminals.
7. Remove 4 screws holding the both sides of heater unit and lift it up carefully.
8. Remove 3 screws holding heater supports and detach the heater.





8.6. Door assemble

1. Open the door and remove 4 screws holding door C.
2. Remove the door C from door E by carefully pulling outward starting from upper right hand corner.
3. Separate the door A from the door E by freeing 8 catch hooks on the door A.

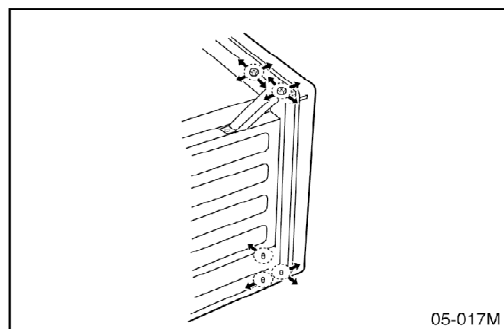
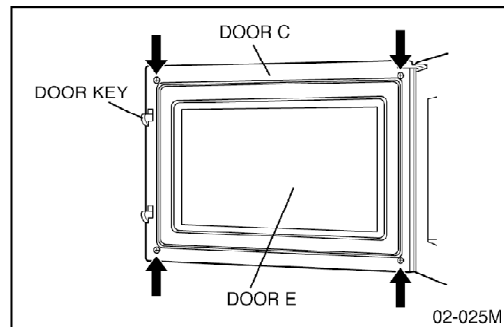
4. Remove door key spring and door key.

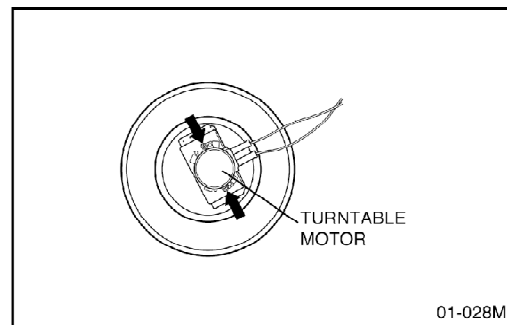
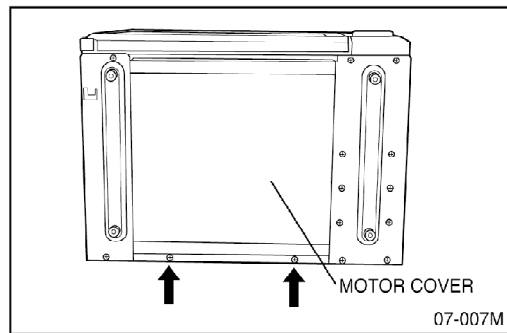
After replacement of the defective component parts of the door, reassemble it and follow the instructions below for proper installation and adjustment so as to prevent an excessive microwave leakage.

- 1. When mounting the door to the oven, be sure to adjust the door parallel to the bottom line of the oven face plate by moving the upper hinge and lower hinge in the direction necessary for proper alignment.**
- 2. Adjust so that the door has no play between the inner door surface and oven front surface. If the door assembly is not mounted properly, microwave may leak from the clearance between the door and oven.**

8.7. Turntable motor

- 1. Remove 2 screws holding motor cover.**
- 2. Disconnect 2 lead wires from turntable motor.**
- 3. Remove 2 screws holding turntable motor.**





9. COMPONENT TEST PROCEDURE

CAUTION

1. High voltage is present at the high voltage terminal of the high voltage transformer during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components, or wiring, always unplug the oven from its power source and discharge the high voltage capacitor.

9.1. Primary Latch Switch, Secondary (Secondary Latch Switch and Power relay 1) Interlocks

1. Unplug lead connectors to Power Relay B and verify continuity of the power relay 1 (RY1) 1-2 terminals.
2. Unplug lead connectors to Primary Latch Switch and Secondary Latch Switch.
3. Test the continuity of switches at door opened and closed positions with ohm meter (low scale). Normal continuity readings should be as follows.

	Door Opened	Door Closed
Primary Latch Switch	$\infty \Omega$ (open)	0 Ω (close)
Secondary Latch Switch	$\infty \Omega$ (open)	0 Ω (close)
Power Relay 1 (RY1)	$\infty \Omega$ (open)	$\infty \Omega$ (open)

9.2. Short Switch & Monitor Circuit

1. Unplug lead wires from H.V. transformer primary terminals.
2. Connect test probes of ohm meter to the disconnected leads which were connected to H.V. Transformer.
3. Test the continuity of short switch with door opened and closed positions using lowest scale of the ohm meter. Normal continuity readings should be as follows.

9.3. High voltage transformer

1. Remove connections from the transformer terminals and check continuity.
2. Normal (cold) resistance readings should be as follows:

Secondary winding Approx. $80\ \Omega \sim 120\ \Omega$

Filament winding Approx. $0\ \Omega$

Primary winding Approx. $0\ \Omega \sim 1\ \Omega$

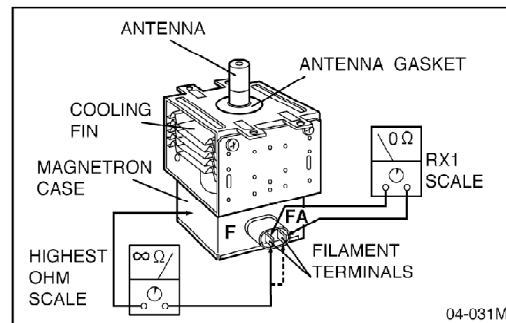
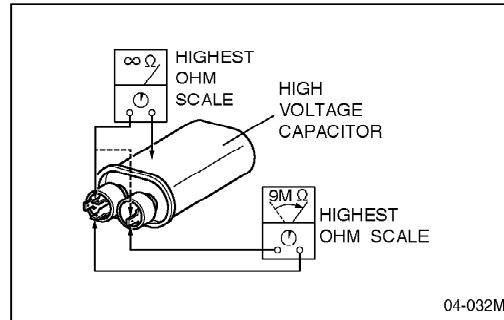
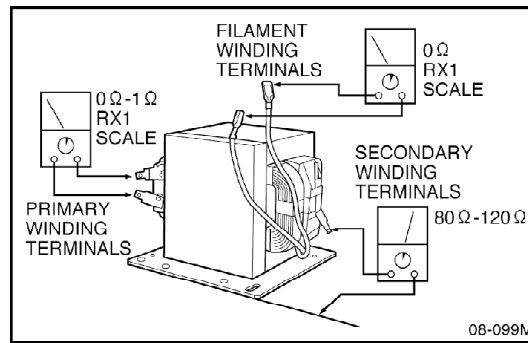
9.4. High voltage capacitor

1. Check continuity of capacitor with meter on highest OHM scale.
2. A normal capacitor will show continuity for a short time, and then indicate $9M\ \Omega$ once the capacitor is charged.
3. A shorted capacitor will show continuous continuity.
4. An open capacitor will show constant $9M\ \Omega$.
5. Resistance between each terminal and chassis should be infinite.

9.5. Magnetron

Continuity checks can only indicate an open filament or a shorted magnetron. To diagnose for an open filament or shorted magnetron.

1. Isolate magnetron from the circuit by disconnecting the leads.
2. A continuity check across magnetron filament terminals should indicate one ohm or less.
3. A continuity check between each filament terminal and magnetron case should read open.



9.6. Diode

1. Isolate the diode from the circuit by disconnecting the leads.
2. With the ohmmeter set on the highest resistance scale, measure the resistance across the diode terminals. Reverse the meter leads and again observe the resistance reading. Meter with 6V, 9V or higher voltage batteries should be used to check the front-to-back resistance of the diode, otherwise an infinite resistance may be read in both directions. A normal diode's resistance will be infinite in one direction and several hundred k Ω in the other direction.

9.7. Membrane key board (Membrane switch assembly)

Check continuity between switch terminals, by tapping an appropriate pad on the key board. The contacts assignment of the respective pads on the key board is as shown in digital programmer circuit.

9.8. Humidity Sensor and digital programmer circuit

CAUTION

Do not touch any parts of the circuitry on the digital programmer circuit since static electric discharge may damage this control panel.
Always ground yourself while working on this panel to discharge any static charge built up on your body.

1. Check across sensor heater terminals. Normal cold resistance should read approx. 4.5 ohm.
2. In order to determine if the Auto/Humidity Sensor function of the digital programmer circuit is in working order or not, do the following test.
 - A. Place a water load in the oven.
 - B. Unsolder 2 black wires connected to sensor terminals.
 - C. Tap Sensor Reheat Pad to set auto sensor cooking and tap Start Pad.
 - D. About 10 seconds after Start Pad is touched, short 2 black wires for 5 seconds and then remove them. Before shorting the 2 black wires you can watch the sensor heater glow red.
 - E. Approx. 75 seconds after the Start Pad is pressed (T0 TIME), short the 2 black wires again.
 - F. "AUTO" should disappear in display window and following digits (see chart) should appear indicating **balance of cooking time (T2 TIME). The time should start to count down and oven should shut off when the time has elapsed.

* T0 TIME	** T2 TIME (balance of cooking time)
70 sec. ~ 79 sec.	12 sec.
80 sec. ~ 89 sec.	15 sec.

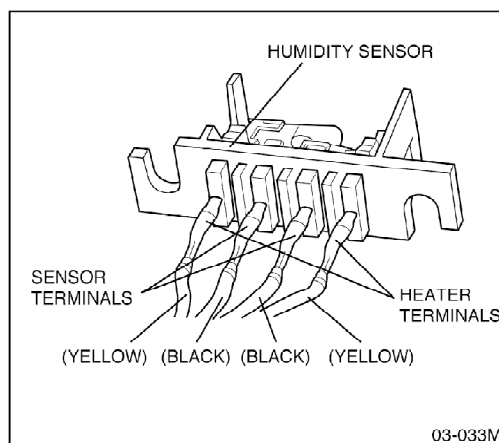
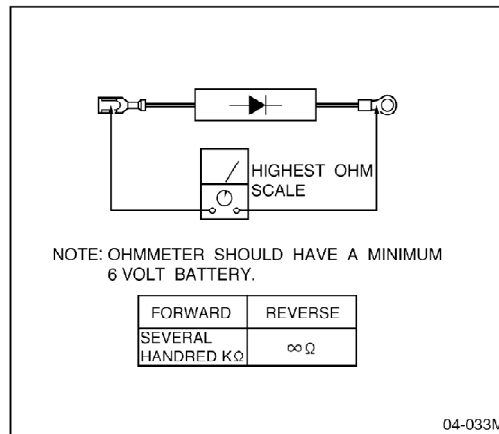
The Auto Sensor function in the digital programmer circuit is working in order if above condition is obtained.

9.9. Oven temp sensor thermistor

This sensor monitors the heat produced by the heater circuit and maintains the oven temperature the user had selected. Normal room temperature, especially in a kitchen can vary anywhere from 50°F to 90°F. The reading across the oven sensor thermistor should be within 100K ohm to 500K ohm when reading in an area within the 50°F to 90°F room temperature range. If the resistance reading is out of the range stated here, the sensor is defective and must be replaced.

NOTE 1: When measuring resistance disconnect the 4-pin connector (CN3) from the DPC otherwise a false reading may be indicated.

NOTE 2: If checking an oven sensor thermistor just after the microwave oven has been operating, the sensor of course won't be room temperature. In this case the sensor must be removed and allowed to cool down to the 50°F to 90°F range.



10. MEASUREMENTS AND ADJUSTMENTS

WARNING		
* For continued protection against radiation hazard, replace only with identical replacement parts as listed below.		
Switch's		U.S.A. MODELS
		CANADA MODELS
Primary latch switch	Part No.	ANE6142-F60
	Type No.	V-15G-3C26
Secondary latch switch	Part No.	A61425180AP
	Type No.	L-3C2-2
Short switch	Part No.	A61785180AP
	Type No.	L-2C2-2
* When the 15 Amp. fuse is blown due to the operation of short switch, you must replace Primary latch switch and short switch. Also replace power relay 1 (Part No. AEG5J1EM18B, Type No. G5J-1-TP) when the continuity check reads shorted contacts (1-2). Then follow the adjustment procedures below. * Interlock switch replacement – In replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches. * Refer to schematic diagram to ensure proper connection.		

10.1. Adjustment of Primary latch switch, Secondary latch switch and short switch

1. When mounting Primary latch switch, Secondary latch switch and short switch to door hook assembly, mount the Primary latch switch, the Secondary latch switch and the short switch to the door hook assembly as shown in table.

NOTE: No specific adjustment during installation of Primary latch switch, Secondary latch switch and short switch to the door hook is necessary.

2. When mounting the door hook assembly to the oven assembly, adjust the door hook assembly by moving it in the direction of arrow in table so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the door hook assembly to the oven assembly.
3. Reconnect the short switch and check the continuity of the monitor circuit and all latch switches again by following the components test procedures.

10.2. Measurement of microwave output

The output power of the magnetron can be determined by performing IEC standard test

procedures. However, due to the complexity of IEC test procedures, it is recommended to test the magnetron using the simple method outlined below.

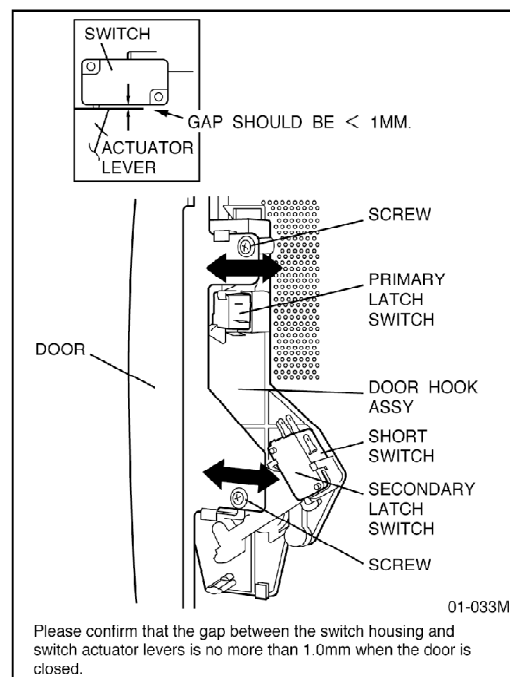
Necessary Equipment:

***1 liter beaker *Glass thermometer**

***Wrist watch or stopwatch**

NOTE: Check the line voltage under load. Low voltage will lower the magnetron output. Take the temperature readings and heating time as accurate as possible.

- 1. Fill the beaker with exactly one liter of tap water. Stir the water using the thermometer and record the beaker's temperature (recorded as T1).**
- 2. Place the beaker on the center of glass cook plate. Set the oven for High power and heat it for exactly one minute.**
- 3. Stir the water again and read the temperature of the beaker (recorded as T2).**
- 4. The normal temperature rise at High power position for each models is as shown in table.**



RATED OUTPUT	TEMPERATURE RISE
850W (IEC705-88)	Min. 13.5°F (7.5°C)

11. PROCEDURE FOR MEASURING MICROWAVE

ENERGY LEAKAGE

WARNING

Check for radiation leakage after every servicing. Should the leakage be more than 2 mW/cm² (1mW/cm² for Canada) inform PASC, PSC, or PCI immediately. After repairing or replacing any radiation safety device, keep a written record for future reference, as required by D.H.H.S. and Health and Welfare Canada regulation. This required must be strictly observed. In addition, the leakage reading must be recorded on the service repair ticket while in the customer's home.

NOTE: The U.S. government standard is 5mW/cm² while in the customer's home. 2mW/cm² stated here is our own voluntary standard.

11.1. Equipment

*Electromagnetic radiation monitor

*Glass thermometer 212°F or 100°F

*600cc glass beaker

11.2. Procedure for measuring radiation leakage

Note before measuring

- (1) Do not exceed meter full scale deflection. Leakage monitor should initially be set to the highest scale.
- (2) To prevent false readings the test probe should be held by the grip portion of the handle only and moved along the shaded area shown in Figure no faster than 1 inch/sec (2.5 cm/sec)
- (3) Leakage with the outer panel removed less than 5mW/cm²
- (4) Leakage for a fully assembled oven with door normally closed less than 2mW/cm² (1mW/cm² for Canada)
- (5) Leakage for a fully assembled oven [Before the latch switch (primary) is interrupted] while pulling the door less than 2mW/cm²

1. Pour 275±15cc (9ozs ± 1/2oz) of 20 ± 5°C(68 ± 9°F) water in a beaker which is graduated to 600cc, and place the beaker in the center of the oven.
2. Set the radiation monitor to 2450MHz and use it following the manufacturer's recommended test procedure to assure correct results.
3. When measuring the leakage, always use the 2 inch (5cm) spacer supplied with the probe.
4. Tap the start pad or set the timer and with the magnetron oscillating, measure the leakage by holding the probe perpendicular to the surface being measured.

(1) Measurement with the outer panel removed.

Whenever you replace the magnetron, measure for radiation leakage before the outer panel is

installed and after all necessary components are replaced or adjusted. Special care should be taken in measuring around the magnetron.

WARNING
Avoid contacting any high voltage parts.

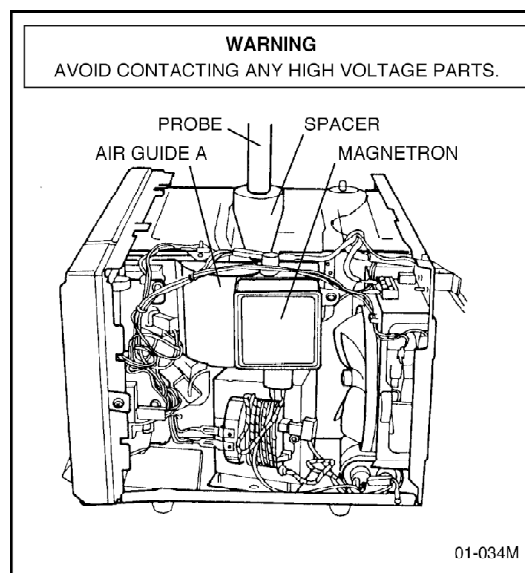
(2) Measurements with a fully assembled oven.

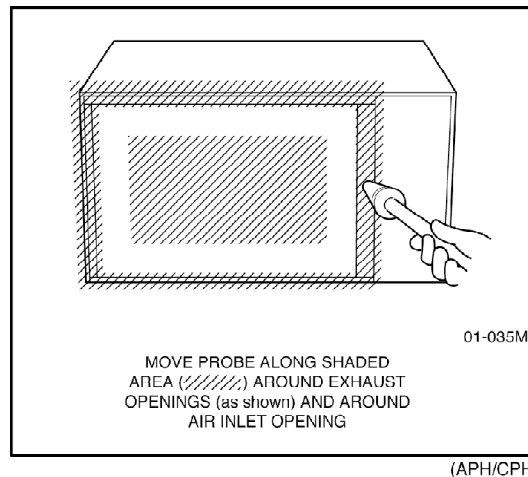
After all components, including the outer panel are fully assembled, measure for radiation leakage around the door periphery, the door viewing window, the exhaust opening and air inlet openings.

11.3. Record keeping and notification after measurement

1. After any adjustment or repair to a microwave oven, a leakage reading must be taken. Record this leakage reading on the repair ticket even if it is zero. A copy of this repair ticket and the microwave leakage reading should be kept by repair facility.
2. Should the radiation leakage be more than $2\text{mW}/\text{cm}^2$ ($1\text{mW}/\text{cm}^2$ for Canada) after determining that all parts are in good condition, functioning properly, and genuine replacement parts as listed in this manual have been used, immediately notify the PASC, PSC or PSI.

11.4. At least once a year, have the radiation monitor checked for calibration by its manufacturer





12. TROUBLESHOOTING GUIDE

CAUTION

1. Check grounding before checking for trouble.
2. Be careful of the high voltage circuit.
3. Discharge high voltage capacitor.
4. When checking the continuity of the switches or the high voltage transformer, disconnect one lead wire from these parts and then check continuity with the AC plug removed. To do otherwise may result in a false reading or damage to your meter.
When disconnecting a plastic connector from a terminal, you must hold the plastic connector instead of the lead wire and then disconnect it, otherwise lead wire may be open or the connector cannot be removed.
5. Do not touch any parts of the circuitry on the digital programmer circuit, since static electric discharge may damage this control panel.
Always touch yourself to ground while working on this panel to discharge any static charge in your body.
6. A 120V AC is present at the shaded area  of the digital programmer circuit (Terminals of power relay's and primary circuit of low voltage transformer). When troubleshooting, be cautious of possible electrical shock hazard.

First of all operate the microwave oven following the correct operating procedures in order to find the exact cause of any trouble.

SYMPTOM	CAUSE	CORRECTIONS
1. Oven is dead. Fuse is OK. No display and no operation at all.	1. Open or loose lead wire harness 2. Open thermal cutout (Magnetron) / (Oven) 3. Open low voltage transformer 4. Defective DPC	Check fan motor when thermal cutout is defective.
2. No display and no operation at all. Fuse is blown.	1. Shorted lead wire harness 2. Defective primary latch switch (NOTE 1) 3. Defective short switch (NOTE 1) 4. Shorted H.V.Capacitor 5. Shorted H.V.Transformer (NOTE 2) NOTE 1: All of these switches must be replaced at the same time. (Refer to adjustment instructions.) Check continuity of power relay 1's contacts (between 1 and 2) and if it has continuity, replace power relay 1 also. NOTE 2: When H.V. Transformer is replaced, check diode and magnetron also.	Check adjustment of primary, secondary latch switch and short switch including door.
3. Oven does not accept key input (Program).	1. Key input is not in-sequence 2. Open or loose connection of membrane key pad to DPC (Flat cable) 3. Shorted or open membrane key board 4. Defective DPC	Refer to operation procedure. Refer to DPC troubleshooting.
4. Oven lamp and turntable motor turn on when oven is plugged in with door closed.	1. Misadjustment or loose wiring of secondary latch switch 2. Defective secondary latch switch	Adjust door and latch switches.
5. Timer starts countdown but no microwave oscillation.	1. Off-alignment of latch switches 2. Open or loose connection of high voltage circuit especially magnetron filament circuit NOTE: Large contact resistance will bring lower magnetron filament voltage and causing magnetron to lower output and/or intermittent oscillation. 3. Defective high voltage component H.V.Transformer H.V.Capacitor H.V.Diode Magnetron 4. Open or loose wiring of power relay 1 (RY1) 5. Defective primary latch switch 6. Defective power relay 1 (RY1) or DPC	Adjust door and latch switches. Check high voltage component according to component test procedure and replace if it is defective. Refer to DPC troubleshooting.

Fig. TROUBLESHOOTING GUIDE 1

	SYMPTOM	CAUSE	CORRECTIONS
6.	Oven can program but timer does not start countdown.	1. Open or loose wiring of secondary latch switch 2. Off-alignment of secondary latch switch 3. Defective secondary latch switch	Adjust door and latch switches.
7.	Microwave output is low. Oven takes longer time to cook food.	1. Decrease in power source voltage 2. Open or loose wiring of magnetron filament circuit (Intermittent oscillation) 3. Aging change of magnetron	Consult electrician.
8.	Turntable motor turns on when door is opened.	1. Shorted primary latch switch	
9.	Oven does not operate and return to plugged in mode after 1 minute elapsed in the all cooking mode.	1. Open or loose wiring of oven temp sensor 2. Defective oven temp sensor 3. Defective DPC	
10.	Loud buzzing noise can be heard.	1. Loose fan and fan motor 2. Loose screws on H.V. Transformer 3. Shorted H.V. Diode	
11.	Turntable motor does not rotate.	1. Open or loose wiring of turntable motor 2. Defective turntable motor	
12.	Oven stops operation during cooking.	1. Open or loose wiring of primary and secondary latch switch 2. Operation of thermal cutout (Magnetron)	Adjust door and latch switches.
13.	Heater does not turn on.	1. Defective heater 2. Defective power relay 7 (RY7) 3. Defective DPC	

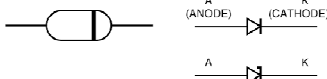
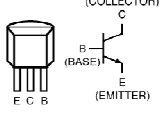
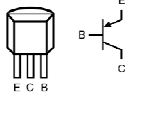
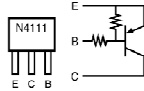
Fig. TROUBLESHOOTING GUIDE 2

Trouble related to Digital Programmer Circuit

SYMPTOM	STEP	CHECK	RESULT	CAUSE/CORRECTIONS
No display when oven is first plugged in	1	Fuse pattern/or fuse of DPC	Normal	STEP 2
			Open (NOTE)	Shorted circuit of ZNR, L. V. T., Oven Lamp etc. Replace DPC
	2	Low voltage transformer (LVT) secondary voltage	Abnormal 0V	LVT
			Normal	→ Step 3
	3	IC-1 pin 1 voltage	Abnormal	IC-10
			Normal = 5V	→ Step 4
	4	IC-1 pin 27 voltage (14 pin of IC-2)	Abnormal	IC-2
			Normal	→ IC-1, CX320, DISPLAY
NOTE Procedure of fuse pattern repairing is as follows: <u>1. When the fuse pattern (PF3) opens.</u> (1) Remove jumper wire (PF2). (2) Insert the removed jumper wire (PF2) to “(PF3)” position and solder it. If both “PF2” and “PF3” fuse pattern are open, please replace DPC.				
NOTE:* At the time of these repairs, make visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short-circuit (check primary coil resistance). If any abnormal condition is detected, replace the defective parts.				
No key input	1	Membrane switch continuity	Abnormal	Membrane switch
			Normal	IC-1
No beep sound	1	IC-1 pin 23 voltage	Abnormal	IC-1
			Normal	BZ, Q310
Power relay 2 (RY-2) does not turn on even though the program has been set and the start pad is tapped	1	IC-1 pin 6 voltage while operation	Abnormal	IC-1
			Normal = 5V	→ Step 2
	2	Short circuit between pin 8 and pin 10 of IC-220	Still not turn on	RY-2
			RY-2 turns on	IC-220
No microwave oscillation at any power setting	1	IC-1 pin 5 and pin 29 voltages while operation at high power	Abnormal	IC-1
			Normal 5...5V, 29...5V IC-1	→ Step 2
	2	Q220 transistor	Abnormal	Q220
			Normal	IC-220, RY-1
Dark or unclear display	1	Replace display and check operation	Normal	DISPLAY
			Abnormal	IC-1
Missing or lighting of unnecessary segment	1	Replace IC-1 and check operation	Normal	IC-1
			Abnormal	DISPLAY

Fig. TROUBLESHOOTING GUIDE 3

13. HOW TO CHECK THE SEMICONDUCTORS USING AN OHM METER

Diode				
	A-K	FORWARD	SMALL	REVERSE ∞
Transistor				
NPN Transistor				
2SC.....		FORWARD	SMALL	REVERSE ∞
2SD.....		B-E	SMALL	∞
		B-C	SMALL	∞
		C-E	∞	∞
PNP Transistor				
2SA.....		FORWARD	SMALL	REVERSE ∞
2SB.....		B-E	SMALL	∞
		C-B	SMALL	∞
		C-E	∞	∞
Digital Transistor				
PNP Transistor				
		FORWARD	REVERSE	
		E-B	10k Ω ~ 30k Ω	10k Ω ~ 30k Ω
		C-B	50k Ω ~ 90k Ω	∞
		C-E	40k Ω ~ 80k Ω	∞

14. EXPLODED VIEW AND PARTS LIST

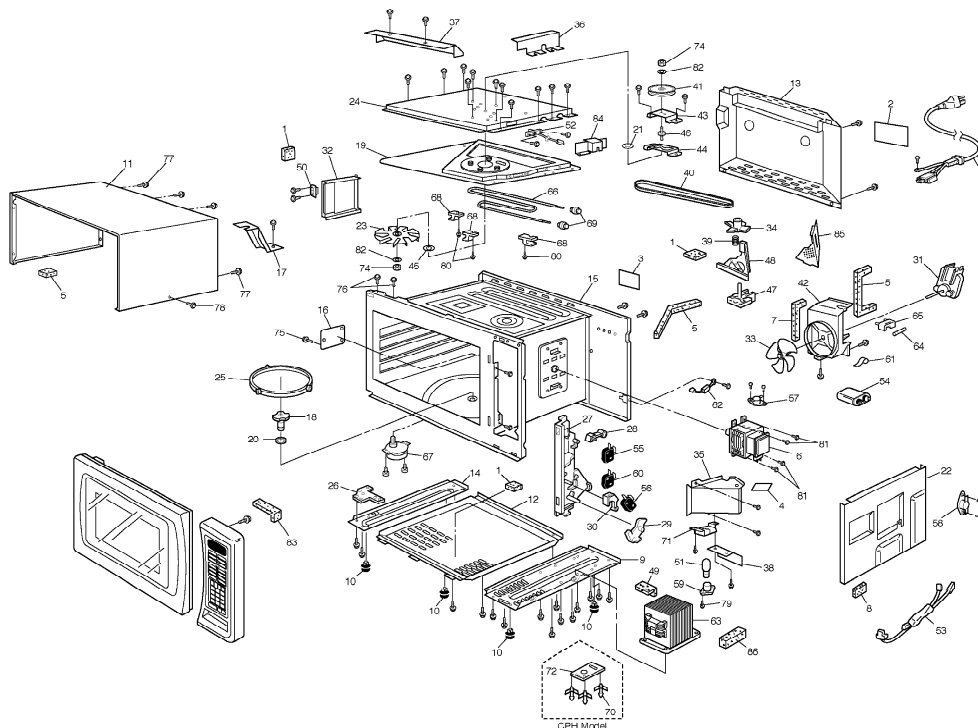


Fig. EXPLODED VIEW

15. PARTS LIST

NOTE: When ordering replacement part(s), please use part number(s) shown in this parts list. Do not use description of the part.

Important safety notice:

Components identified  by mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

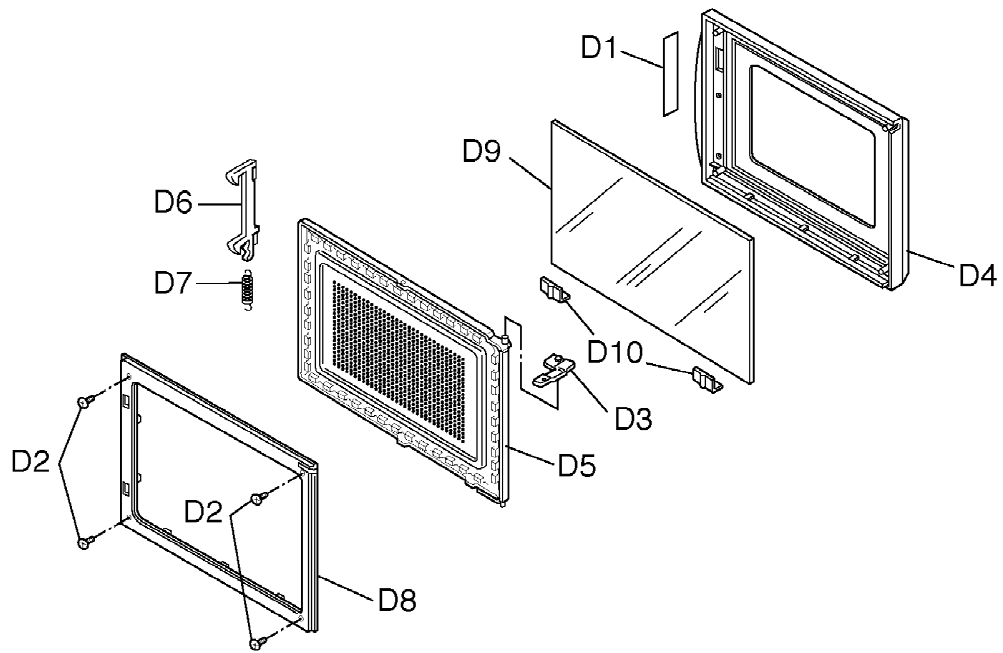
Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
<u>1</u>	ANE000Z000AD	CUSHION RUBBER A	3	
<u>2</u>	A00066670AP	CAUTION LABEL A	1	NN-C988B APH NN- C988W APH
2	A00066670CP	CAUTION LABEL A	1	NN-C988B CPH NN- C988W CPH
<u>3</u>	A00069770AP	CAUTION LABEL B	1	NN-C988B APH NN- C988W APH
<u>4</u>	A00336670AP	FUSE LABEL	1	NN-C988B APH NN- C988W APH
<u>5</u>	ANE000Z000AA	CUSHION RUBBER A	3	
<u>6</u> 	2M210-M1E	MAGNETRON	1	NN-C988B APH NN- C988W APH
<u>6</u> 	2M210-M1F	MAGNETRON	1	NN-C988B CPH NN- C988W CPH
<u>7</u>	ANE0924000AQ	CUSHION RUBBER C	1	
<u>8</u>	ANE0962000AD	CUSHION RUBBER D	1	
<u>9</u>	A10015450AP	BASE	1	
<u>10</u>	A10086210AP	RUBBER FOOT	4	NN-C988B APH NN- C988W APH
10	ANE1008-3W0	RUBBER FOOT	4	NN-C988B CPH NN- C988W CPH
<u>11</u>	A10096670AP	CABINET BODY	1	NN-C988B
11	A10096660HQP	CABINET BODY	1	NN-C988W
<u>12</u>	A10266660QP	BASE C	1	
<u>13</u>	A10586670AP	BACK PANEL COVER A	1	
<u>14</u>	A11295450AP	BASE B	1	
<u>15</u> 	A200A6670AP	OVEN	1	
<u>16</u>	A20555450AP	COVER	1	
<u>17</u>	A20766660QP	REINFORCE BRACKET C	1	
<u>18</u>	A21315870GP	PULLEY SHAFT	1	
<u>19</u>	A21446660QP	UPPER PANEL	1	
<u>20</u>	ANE2177-F80	WASHER	1	
<u>21</u>	A21776660QP	WASHER	1	
<u>22</u>	A22365450AP	RIGHT HEATER PANEL	1	
<u>23</u>	ANE22392L0AP	CIRCULATION FAN	1	
<u>24</u>	A22786660QP	UPPER HEATER PANEL	1	
<u>25</u>	A290D5080BP	ROLLER RING (U)	1	
<u>26</u> 	A30076660QP	LOWER HINGE	1	
<u>27</u> 	A3020-1200	DOOR HOOK A	1	
<u>28</u>	A3136-1200	HOOK SPACER A	1	
<u>29</u>	A31374650AP	HOOK SPACER B	1	
<u>30</u>	A31384650AP	HOOK SPACER C	1	
<u>31</u>	A400A4010AP	FAN MOTOR	1	(24W)
<u>32</u>	A400K5040AQ	EXHAUST GUIDE	1	
<u>33</u>	ANE40086W0AP	FAN	1	
<u>34</u>	A40085020AQ	FAN	1	
<u>35</u>	A40256660QP	AIR GUIDE A	1	
<u>36</u>	A40266660QP	AIR GUIDE B	1	

36	A40266660QP	AIR GUIDE B	1	
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Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
37	A40316670AP	AIR GUIDE C	1	
38	A40476660QP	AIR GUIDE E	1	
39	ANE4057-F50	SPRING	1	
40	A40606660QP	BELT A	1	
41	A41325020AQ	PULLEY B	1	
42	A41445020AP	ORIFICE	1	
43	A41575450AP	FAN BRACKET A	1	
44	A41585450AP	FAN BRACKET B	1	
45	A41635020AQ	FAN SPACER C	1	
46	A400S6660QP	SHAFT (U)	1	
47	A41799190AP	HEATER FAN MOTOR	1	(16W)
48	A41806660QP	HEATER FAN MOTOR BRACKET	1	
49	ANE0911000DC	CUSHION RUBBER B	1	NN-C988B CPH NN- C988W CPH
50	A601L4780AP	TEMP SENSOR	1	
51	ANE60307J0AP	INCANDESCENT LAMP	1	(125V 20W)
52	A605A9790AP	THERMISTOR	1	
53	A606V5110BP	PROTECTOR DIODE	1	
54 	A60905500AP	H.V.CAPACITOR	1	(1MF/2100V)
55 	ANE6142-F60	MICROSWITCH	1	(V-15G-3C26- 1) PRIMARY LATCH SWITCH
56 	A61425180AP	MICROSWITCH	1	(L-3C2-2) SECONDARY LATCH SWITCH
57 	A61455500AP	THERMAL CUTOUT	1	
58 	A61456670AP	THERMAL CUTOUT	1	NN-C988B APH NN- C988W APH
59 	A61524000AP	SOCKET	1	
60 	A61785180AP	MICRO SWITCH	1	(L-2C2-2) SHORT SWITCH
61	A61884060AP	CAPACITOR BRACKET	1	
62 	A62024000AP	DIODE SI	1	
63	A621B6670AP	H.V.TRANSFORMER	1	(1.5KVA)
64 	A62305180AP	FUSE	1	(15A)
65	A62314000AP	FUSE HOLDER	1	
66	A630G6660AP	HEATER A	1	
67	A63265850AP	TURNTABLE MOTOR	1	(2.5W)
68	A64175130AP	HEATER SUPPORT	3	
69	ANE6501K90AP	HEATER HOLDER	2	
70	A65326670CP	HOLDER	3	NN-C988B CPH NN- C988W CPH
71	A66036000BP	OVEN LAMP BRACKET	1	
72	A692Y667ACP	NOISE FILTER (U)	1	NN-C988B CPH NN- C988W CPH
73 	A900C5520AP	AC CORD W/PLUG	1	NN-C988B APH NN- C988W APH (120V)

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
73 	A900C6240CP	AC CORD W/PLUG	1	NN-C988B CPH NN- C988W CPH (120V)
74	XNG4EVS	NUT	2	
75	XST4+5VS	SCREW	1	(4X5) FOR COVER
76	XSWANE5+10U	SCREW	2	(5X10) FOR HINGE
77	XTTANE4+12A	SCREW	2	NN-C988B APH NN- C988W APH (4X12) FOR CABINET BODY
78	XTT4+8FZ	SCREW	1	NN-C988B (4X8) FOR CABINET BODY
78	XTT4+8BN	SCREW	1	NN-C988W (4X8) FOR CABINET BODY
79	XTWANE3+10S4	SCREW	1	(3X10) FOR SOCKET
80	XTWANE35+14N	SCREW	3	(3.5X14) FOR HEATER SUPPORT
81	XTWANE4+ 10RU	SCREW	4	(4X10) FOR MAGNETRON
82	XWS4VL	WASHER	2	
83	ANE0921000BK	CUSHION RUBBER C	1	
84	A64499770AP	SENSOR COVER	1	
85	A40306660QP	AIR GUIDE D	1	
86	ANE0917000CC	CUSHION RUBBER B	1	

16. DOOR ASSEMBLY



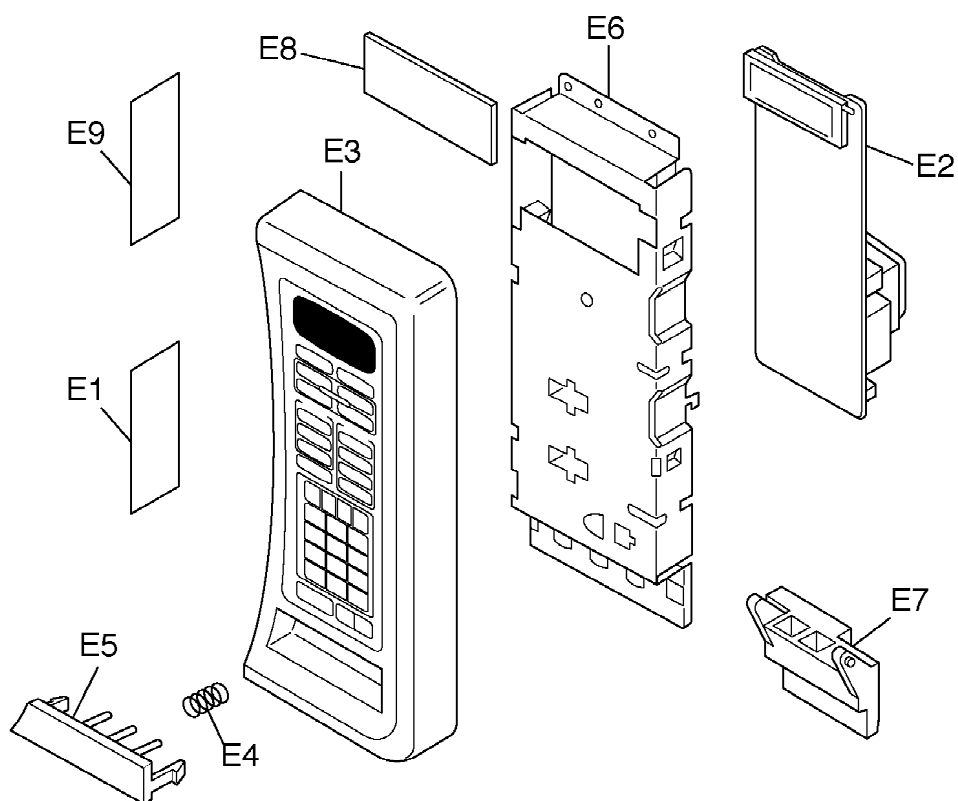
(S-977 APH)

DOOR ASSEMBLY

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
D1	A04115020CQ	CSA LABEL	1	NN-C988B CPH NN- C988W CPH
D2	XTBANE4+12FK	SCREW	4	(4X12)
D3	A300B5450AP	UPPER HINGE	1	
D4	A30019770AP	DOOR A	1	NN-C988B (NOTE 1)
D4	A30019770HAP	DOOR A	1	NN-C988W (NOTE 1)
D5	A302K6660QP	DOOR E (U)	1	
D6	A30186660QP	DOOR KEY A	1	
D7	A30214000AP	DOOR KEY SPRING	1	
D8	A30856660QP	DOOR C	1	
D9	A31469770AP	DOOR SCREEN B	1	NN-C988B
D9	A31469770HAP	DOOR SCREEN B	1	NN-C988W
D10	A32779190AP	DOOR SCREEN BRACKET	2	

NOTE 1: Please order CSA label together. (CPH Model only)

17. ESCUTCHEON BASE ASSEMBLY



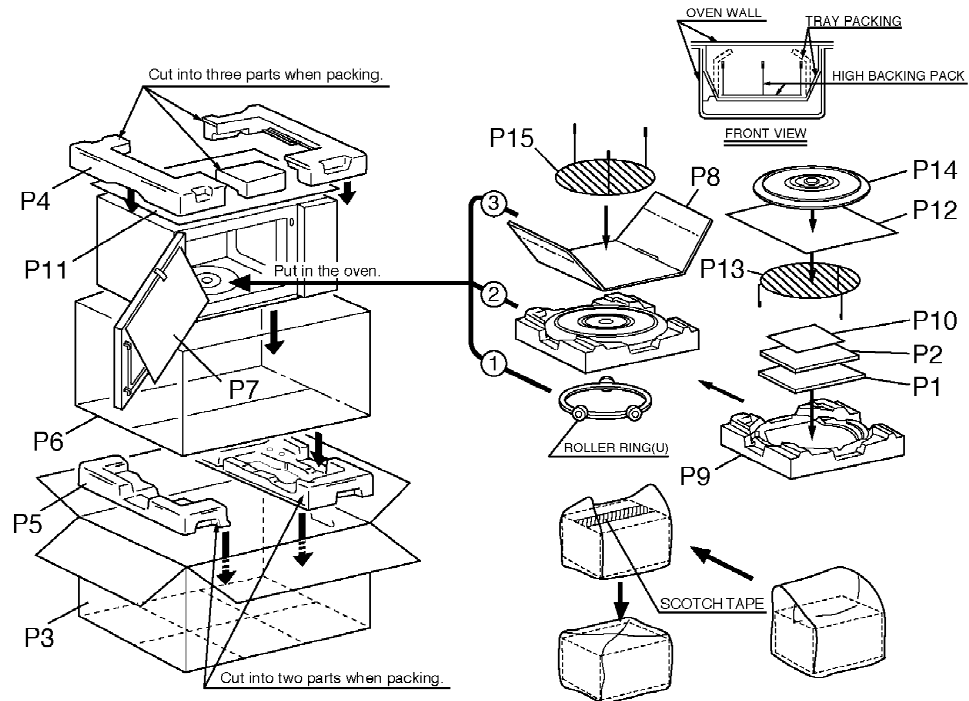
(S-977 APH)

ESCUTCHEON BASE ASSEMBLY

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
E1	A01579770AP	NAME LABEL	1	NN-C988B APH
E1	A01579770HAP	NAME LABEL	1	NN-C988W APH
E2	A603L9770AP	D.P.CIRCUIT (U)	1	NN-C988B APH NN-C988W APH RTL (W/ COMPONENT)
E2	A603L9770CP	D.P.CIRCUIT (U)	1	NN-C988B CPH NN-C988W CPH RTL (W/ COMPONENT)
E3	A800A9770AP	ESCUTCHEON ASSEMBLY	1	NN-C988B (NOTE 2)
E3	A800A9770HAP	ESCUTCHEON ASSEMBLY	1	NN-C988W (NOTE 2)
E4	ANE80378A0AG	COOK BUTTON SPRING	1	
E5	A80729770AP	DOOR OPENING BUTTON	1	NN-C988B
E5	A80729770HAP	DOOR OPENING BUTTON	1	NN-C988W
E6	A81279770AP	BACK PANEL	1	
E7	A82569770AP	DOOR OPENING LEVER	1	
E8	A80025540AP	ESCUTCHEON B	1	
E9	ANE0245X00AP	DHHS LABEL	1	NN-C988B APH NN-C988W APH

NOTE 2: Please order name label and DHHS label together. (APH Model only)

18. PACKING AND ACCESORIES



(S-977 APH)

PACKING AND ACCESORIES

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
W1	A030A9770AP	LEAD WIRE HARNESS	1	NN-C988B APH NN- C988W APH
W1	A030A9770CP	LEAD WIRE HARNESS	1	NN-C988B CPH NN- C988W CPH
W2	A03536660QP	LEAD WIRE	1	
W3	A03536670AP	LEAD WIRE	1	NN-C988B APH NN- C988W APH
W4	A50966520UP	FERRITE CORE	1	NN-C988B CPH NN- C988W CPH

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
REF NO. 72 NOISE FILTER (U)				
	ECKDNA472ME	CERAMIC CAPACITOR	2	0.0047MF 250V
C1	ECQU2A104MNA	POLYESTER CAPACITOR	1	0.1MF 250V
L1	A621A7600CP	FILTER COIL	1	
R1	ERD25FJ564S	CARBON FILM RESISTOR	1	560K Ω 1/4W 5%
ZNR2 3	ERZC10DK112R	VARISTOR 2		

PARTS LIST FOR MICROWAVE OVEN TRIM KITS

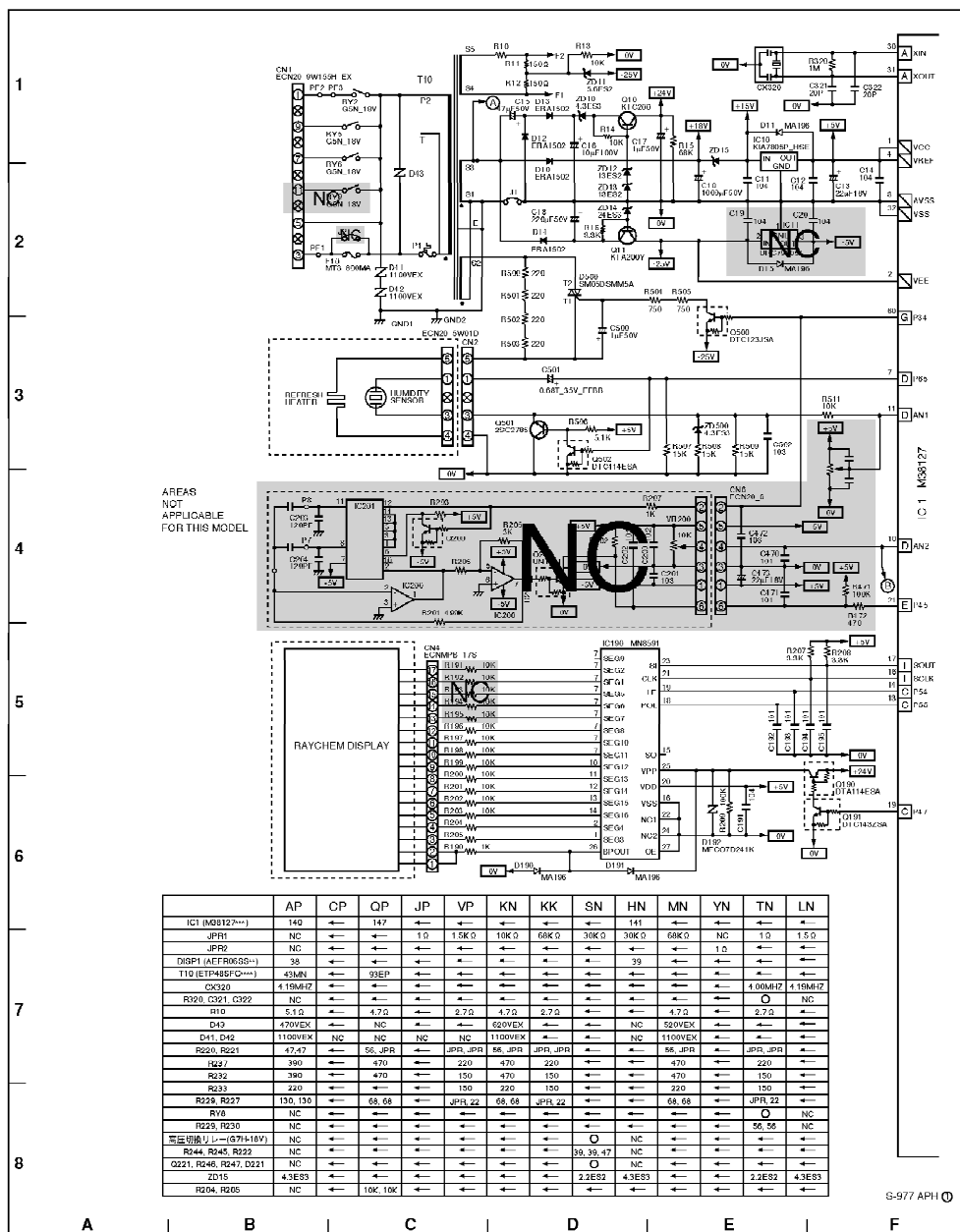
Exploded View

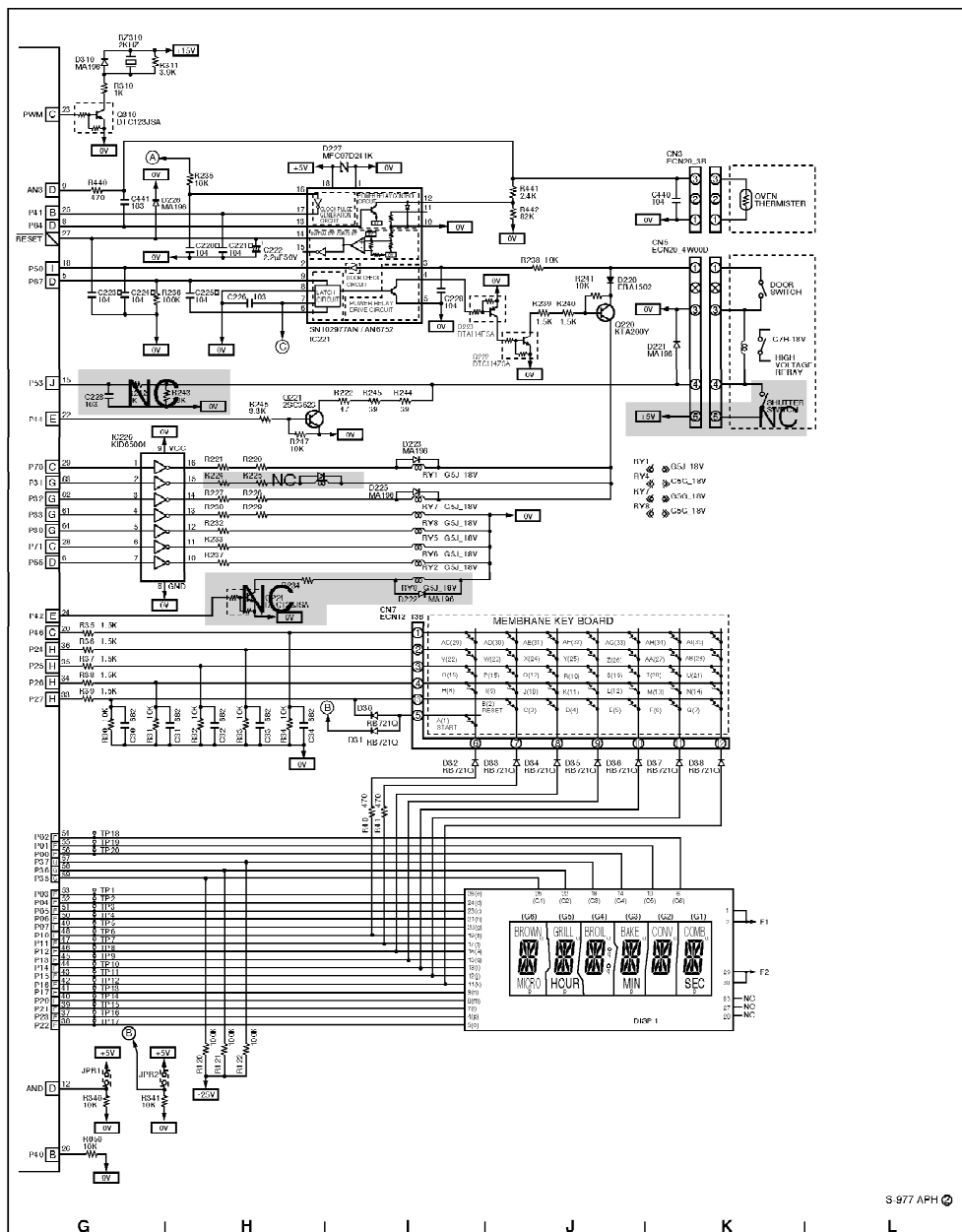
Trim Kit Model No.	Top and Bottom Strip Ref No:1.2	Pcs/ Set	Side Strip Ref No:3.4	Pcs/ Set	Microwave Oven Model No.
NN-TK909	A1603A000AP	2	A1601A240AP	2	NN-C988B
NN-TK909W	A1603A000HAG	2	A1601A240HAP	2	NN-C988W

NOTE: The top and bottom strips have the same part number and the left and right side strips also have the same part number.
These parts will be supplied on one piece per one part number.

20. DIGITAL PROGRAMMER CIRCUIT

SCHEMATIC DIAGRAM





21. DIGITAL PROGRAMMER CIRCUIT

PARTS LIST

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
BZ310	AEFB22EP20TL	BUZZER	1	2.0KHZ
C10	ECA1HM102E	ELECTROLYTIC CAPACITOR AL	1	1000MF/50V
C11 12 14 191 220 223 228 440	AECF50F104Z	CERAMIC CAPACITOR	8	0.1MF/50V
C13	ECEA1CKA220B	ELECTROLYTIC CAPACITOR AL	1	22MF/16V
C15	ECA1HM470B	ELECTROLYTIC CAPACITOR AL	1	47MF 50V
C16	ECA2AM100B	ELECTROLYTIC CAPACITOR AL	1	10MF/100V
C17 500	ECEA1HKA010B	ELECTROLYTIC CAPACITOR AL	2	1MF/50V
C18	ECA1HM221B	ELECTROLYTIC CAPACITOR AL	1	220MF/50V
C30 31 32 33 34	ECBT1C682MR5	CERAMIC CAPACITOR	5	
C192 193 194 195	ECBT1H101KB5	CERAMIC CAPACITOR	9	0.0001MF/50V
C221 224 225 226 441 502	ECBT1E103ZF5	CERAMIC CAPACITOR	6	0.01MF/25V
C222	ECEA1HKA2R2B	ELECTROLYTIC CAPACITOR AL	1	2.2MF/50V
C501	ECSF1VE6842B	ALUMINIUM CAPACITOR	1	0.68MF/35V
CN1	AEEMMD15509W	CONNECTOR	1	9PIN
CN2	AEEMMF01D05W	CONNECTOR	1	5PIN
CN3	AEEMMF00703R	CONNECTOR	1	3PIN RED
CN4	AEEMMPB170	CONNECTOR	1	17PIN
CN5	AEEMMF00D04W	CONNECTOR	1	4PIN
CN7	AEEM13FDZ0TM	CONNECTOR	1	13PIN
CX320	EFOEC4194T4	RESONATOR	1	4.19MHZ
D10 12 13 14 220	AEDNERA1502	DIODE SI	5	1A
D11 190 191 223 224 225 310	MA196-(TA5)	DIODE SI	7	0.1A
D43	ERZV10D471CS	VARISTOR	1	V10471U
D26 27	ERZV10D112C1	VARISTOR	2	NN-C988B APH NN- C988W APH V10112U
D30 31 32 33 34 35 36 37 38	AEDNRB721Q	DIODE SI	9	
D192 227	AERZ07D241KT	VARISTOR	2	
D500	AESM05DSMM5A	TRIAC	1	AC05DSM
DISP1	AEFR06SS38	DISPLAY TUBE	1	06SS38
IC1	AEIC38127148	IC	1	M38127
IC10	AEICKIA7805P	IC	1	KIA7805P

1928	1928-1929	1929	1930	1931	1932
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Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
IC190	MN8591	IC	1	MN8591
IC220	AEICKID65004	IC	1	KID65004AP
IC221	AN6752	IC	1	
Q10	AESCKTC200	TRANSISTOR SI 625MW	1	KTC200 300MHZ
Q11 220	AESAKTA200Y	TRANSISTOR SI 625MW	2	KTA200Y 200MHZ
Q190 223	AESA14EST	TRANSISTOR SI 300MW	2	DTA114ESATP 100MHZ
Q191 222	AESC43ZST	TRANSISTOR SI 300MW	2	DTC143ZSATP 100MHZ
Q310 500	AESC23JST	TRANSISTOR SI 300MW	2	DTC123JSATP 100MHZ
Q501	2SC2785TFK	TRANSISTOR SI 250MW	1	2SC2785TFEK 250MHZ
Q502	AESC14EST	TRANSISTOR SI 300MW	1	DTC114ESATP 100MHZ
R10	ERDS2TJ5R1T	CARBON FILM RESISTOR	1	5.1 Ω 1/4W 5%
R11 12	ERDS2TJ151T	CARBON FILM RESISTOR	2	150 Ω 1/4W 5%
R13 14 31 32 33 34 196 197 198 199 200 201 202 203 235 238 241 340 341 511 650 30	ERDS2TJ103T	CARBON FILM RESISTOR	22	10K Ω 1/4W 5%
R15	ERDS2TJ683T	CARBON FILM RESISTOR	1	68K Ω 1/4W 5%
R16 207 208	ERDS2TJ332T	CARBON FILM RESISTOR	3	3.3K Ω 1/4W 5%
R120 121 122 190 236	ERDS2TJ104T	CARBON FILM RESISTOR	10	100K Ω 1/4W 5%
R220 221	ERDS2TJ470T	CARBON FILM RESISTOR	2	47 Ω 1/4W 5%
R226 227	ERDS2TJ820T	CARBON FILM RESISTOR	2	82 Ω 1/4W 5%
R232 237	ERDS2TJ391T	CARBON FILM RESISTOR	2	390 Ω 1/4W 5%
R233 500 501 502 503	ERDS2TJ221T	CARBON FILM RESISTOR	5	220 Ω 1/4W 5%
R35 36 37 38 39 239 240	ERDS2TJ152T	CARBON FILM RESISTOR	7	1.5K Ω 1/4W 5%
R190 310	ERDS2TJ102T	CARBON FILM RESISTOR	2	1.0K Ω 1/4W 5%
R311	ERDS2TJ392T	CARBON FILM RESISTOR	1	3.9K Ω 1/4W 5%

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
R40 41 440	ERDS2TJ471T	CARBON FILM RESISTOR	3	470 Ω 1/4W 5%
R441	ERDS2TJ242T	CARBON FILM RESISTOR	1	2.4K Ω 1/4W 5%
R442	ERDS2TJ823T	CARBON FILM RESISTOR	1	82K Ω 1/4W 5%
R504 505	ERDS2TJ751T	CARBON FILM RESISTOR	2	750 Ω 1/4W 5%
R506	ERDS2TJ512T	CARBON FILM RESISTOR	1	5.1K Ω 1/4W 5%
R507	ERDS2TJ153T	CARBON FILM RESISTOR	1	15K Ω 1/4W 5%
R508	ERDS2TJ223T	CARBON FILM RESISTOR	1	22K Ω 1/4W 5%
R509	ERDS2TJ105T	CARBON FILM RESISTOR	1	1M Ω 1/4W 5%
RY1 	AEG5J1EM18B	POWER RELAY	1	G5J-1-TP-M- ER18
RY2 5 6 	AEBGG5N1A18	POWER RELAY	3	G5N-1A18V
RY 	AEGG5G1A18	POWER RELAY	1	G5G-1A-ER18
SPACER	A82847010AP	SPACER CUSHION	1	
T10	ETP48SFC43MN	L.V.TRANSFORMER	1	
ZD10 15 500	AEDZ4R3ES3T1	ZENNER DIODE SI	3	RD4.3ES3
ZD11	AEDZ5R6ES2T1	ZENNER DIODE SI	1	RD5.6ES2
ZD12 13	AEDZ13ES2T1	ZENNER DIODE SI	2	RD13ES2T1
ZD14	AEDZ24ES3T1	ZENNER DIODE SI	1	RD24ES3
	A62309770AP	FUSE	1	